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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,657	12/19/2001	Raimund Meyer	HSS-0001	1149
23550	7590	05/17/2006	EXAMINER	
HOFFMAN WARNICK & D'ALESSANDRO, LLC			LU, JIA	
75 STATE STREET			ART UNIT	
14TH FLOOR			PAPER NUMBER	
ALBANY, NY 12207			2611	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H-D

Office Action Summary

Application No. 10/027,657	Applicant(s) MEYER ET AL.	
Examiner Jia W. Lu	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3, 10-12 and 19 is/are allowed.
- 6) ☒ Claim(s) 4-9, 13-18 and 20-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment has been fully considered. However, upon further consideration, a new ground(s) of rejection is made in view of reference cited in action below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 4, 13 and 20 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The DFE filter described in paragraph 41 is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). According to specifications, the "filter coefficients" that are optimized by "signals after the projections" deal with the DFE structures (see paragraph 23, 41-43), but this feature is not in the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 5-7, 14-16, 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,430, 216, in view of US 6,745,050, further in view of US 6,606,129. Patent '216 describes an interference suppression for a multi-antenna system where the projection of a filtered signal is used for detection (see abstract and figure 2, item 102; See figure 4 for the use of projections). The projected signal in figure 4 is also shown to be in the direction of the received vector "y".

Patent '216 states:

"The projection builder 98 selects 118 a portion of the filtered signal to process, collects 122 appropriate candidate user codes for the users transmitting signal segments of the selected filtered signal portion from the output of the user code generator, and, using the receive time offsets, trial times, and candidate symbols, creates 126 a set of hypothetical projection operators." (Column 6, lines 60-67)

Furthermore, after signal projection the signal is processed through a Rake filter (see fig 1, item 82) and detected (see figure 1, items 86 and 90). Regarding claim 11, figure 4 shows that the projection vector is in a 2-d Space. While patent '216 does not show the projection to be orthogonal, patent '050 shows this feature (see column 7, lines 38-51). It would have been obvious to one ordinarily skilled in the art to use orthogonal projection in a system described in patent '216 in order to achieve a robust, generic and accommodating interference suppression. While the combined references used above do not describe adaptive algorithms

used for adjusting filter coefficients including the use of training sequence or a blind adaptive algorithm, such use is well known in the art (for example see patent '129, column 9, lines 13-30), and it would have been obvious to one ordinarily skilled in the art to use different adaptive algorithms for filter coefficient adjustments in order to provide flexible processing techniques to accommodate changing environments.

3. Claims 8, 17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,430, 216, in view of US 6,745,050, further in view of US 6,018,317. These claims share limitations with claims rejected in 2 above; further, patent '317 shows the calculation of orthogonal complements of projections (column 21, lines 30-33), and it would have been obvious to one ordinarily skilled in the art to calculate orthogonal complements in the receiver in '216 in order to identify and separate signals from interference and aid in signal recovery (column 21, lines 28-45).
4. Claims 9, 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,430, 216, in view of US 6,745,050. These claims share limitations with claims rejected in 2 above; further, '216 treats at least a part of transmit signals as interference (see abstract).

Allowable Subject Matter

5. Claims 1, 3, 10, 11, 12, 19 are allowed. Prior art failed to show a method interference suppression comprising forming orthogonal projection of at least one

filter output signal onto a vector before equalization and signal detection, where at least two received signals are available corresponding to at least two outputs projected onto identical vectors; Prior art also failed to show a method interference suppression comprising forming orthogonal projection of at least one filter output signal onto a vector before equalization and signal detection, where equalization included feedforward filters of a DFE, according to the criteria ZF, MMSE or impulse truncation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jia W. Lu whose telephone number is 571-272-6042. The examiner can normally be reached on Mon- Fri, 10:30AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571)272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Jia Lu
Examiner


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER